Acquiring Joint Capability

An Industry Perspective

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Agenda

- **Introduction**
- **Challenges and Perspectives**
- **Acquisition Considerations**
- **Conclusions**

Challenges of a New Information Environment

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Business Challenges

- Explosive growth in amount/variety of information available and the speed at which it is delivered
- Identifying "knowledge" within your organizational domain
  - Separating the wheat from the chaff
- Knowledge discovery across an enterprise

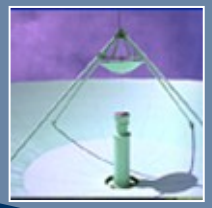
Legacy Technology Challenges

- Non-integrated systems/tools
- Disparate DBs and data structur
- Limited collaboration

Text

Geospatial

R&D



Multimedia

Today's Technology Challenge

Creating Effective, Agile, Service-Oriented Solutions

- Connectivity, Speed, Volume
- Knowledge Creation
- Information Sharing
- Information Management
- Business Process Management
- Effects-centric integration
- Federated Search

Success Requires an Integrated Focus on Mission and the Enterprise

Integration Perspectives

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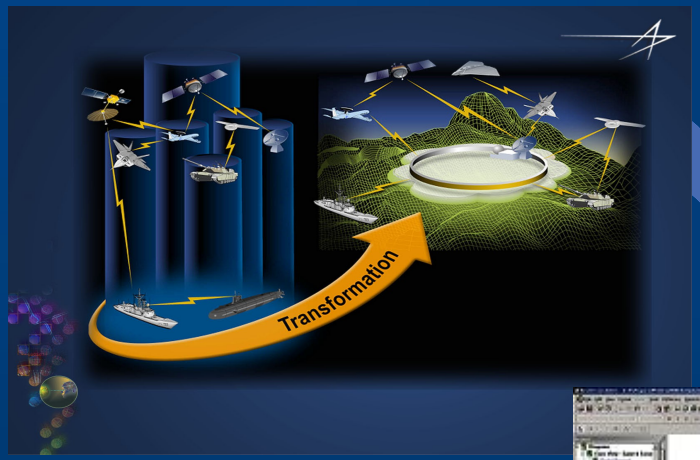
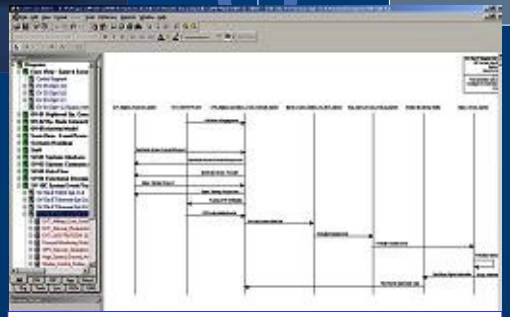
Focus on the Mission

System Acquisition / Operations



Mission Activities

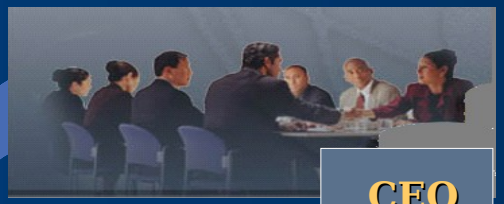
- Find
- Fix
- Track
- Target
- Execute
- Assess
- Observe
- Orient
- Decide
- Act



ACTIVITY MODELS

Focus on the Enterprise

Strategic Planning, Bus. Processes, Rhythms



CEO

OE 1 | OE 2 | OE 3 | OE 4

Enterprise Activities

- Investment Planning
- R&D / Technology Assessment
- Product Design / Development
- Marketing / Sales
- Customer Support
- Resource Management
- Accounting / Finance
- etc.

Improved Mission Effectiveness

- Increased Capacity
- Increased Responsiveness
- Increased Quality / Assuredness

Improved Operating Efficiency

- Increased Collaboration / Reuse
- Reduced Redundancy
- Reduced Cost

Spectrum of Acquisition Strategies

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Increasing Levels of Consolidated Contractor Responsibility, Accountability, and Authority

INTEGRATION — **Lead Systems Integration Categories**

SETA	System-of-Systems SI	Prime Integration Contractor(s)	"Lead Systems Integrator"	Total System Performance Responsibility
Several Examples	*NSA LSI and Several National SI Programs*	*NGA GeoScout NRO FIA*	*DARPA/USA FCS USCG DeepWater*	*USAF ISC-2 and F-117*

DEVELOPMENT

Increasingly Includes Implementation	"Best-of-Breed" Associate Contractors	Few Primes with Teammates, Directed Subs	Single Prime with Teammates, Directed Subs
			Subsequent Competitions Generally Set Team

- **Focus on what best fits the needs of the enterprise problem-space and establish the environment and design the acquisition strategy accordingly**
- **Create the approach that *matches* the driving enterprise considerations**
- **Align the government organization and responsibilities to *enable* the acquisition strategy**

The Acquisition Strategy Should Integrate the Essential Elements of Success

Essential Elements for Success

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GOVT focused on Inherently Governmental Functions (FAR 7.5)

- User Requirements/Capabilities
- Contract Management
- Budgeting
- Product Acceptance
- Program Direction
- Security

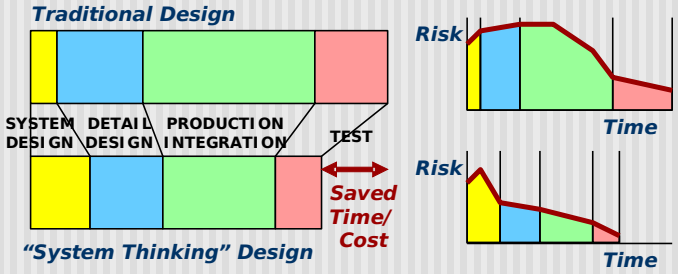
Government has unique domain competencies and plays a critical decision-making role in driving the enterprise goals … ultimately held accountable

Program Management	• Business Planning & Strategy • Acquisition Management • Integrated Master Schedule	• Risk/Opportunity Management • Readiness Assessments • System Level Actions
System Engineering	• System Baseline Definition & CONOP • Systems Requirements & SOC • Technology Development • Architecture Definition & Segmentation	• Inter-Segment and External Interface Definition • System Test, Evaluation & Certification • System Transition and Deployment
Systems Analysis	• End-to-End Performance Analysis • CAIV Studies	• Technical Feasibility Assessments
Segment Design	• Segment Baseline Definition, CONOP, SOC • Requirements Decomposition and Segment Design • Component Requirements Definition • Intra-Segment Interface Definition	• Segment Development, Implementation, and Technology Integration • Segment Test & Evaluation • System IC&T, Transition, and Deployment Support
Configuration Management		• Change Management
Sustainment & Operation	• Segment Sustainment • System O&M (Mission and Infrastructure)	• Technology Insertion • Mission Conduct

Study by INCOSE on Value of SE

Heuristic Claim of SE

- Better systems engineering leads to
  - Better system quality/ value
  - Lower cost
  - Shorter schedule



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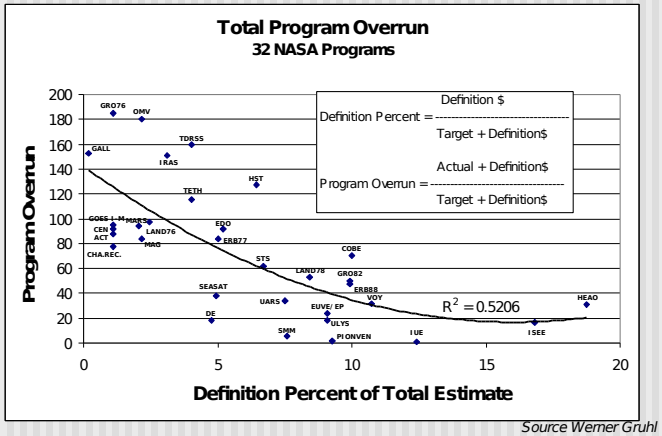
NASA Tracking 1980s



Source Werner Gruhl
NASA Comptroller's Office

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- **Effective *System Engineering & Integration* is an *Investment in Risk Reduction*, Saving Time, Money, and Ensuring Continuing focus on Achieving Enterprise Goals**
- **Quality SE&I is a Force-Multiplier in the Acquisition Community … but …When Programs Need it Most, the SE&I Funds are Typically Reduced**
- **Experience has shown System Engineering should be 7-10% of Total Program Cost**

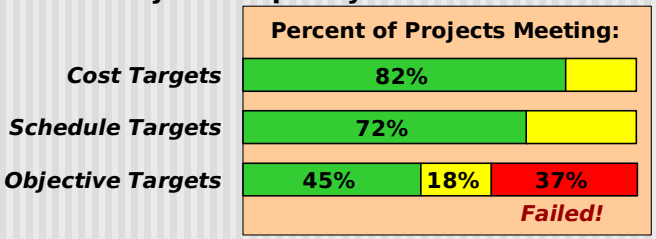
Source: Understanding the Value of Systems Engineering; Eric Honour, SECOE

"Large Engineering Projects"

- **Study of 60 LEPs (power generation, transportation, oil production, technology)**

***The Strategic Management of Large Engineering Projects*, MIT Press 2000**

- **Evaluation by interviews and by objective and subjective quality measures.**



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Enterprise System Engineering Aligned to Customer Goals

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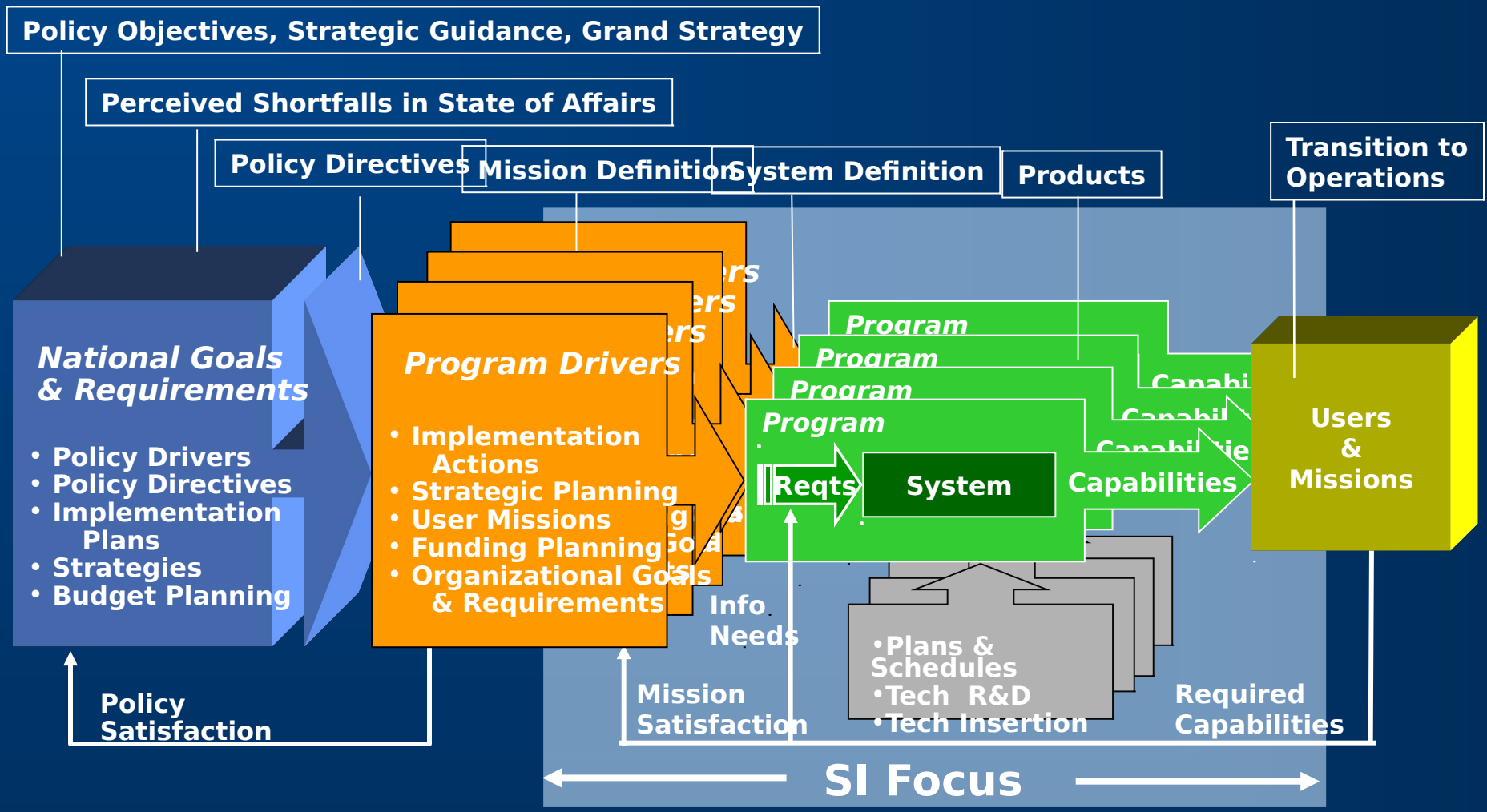

Enterprise System-of-Systems Integration Model for Risk Management & End-to-End Mission Success

Systems Engineering Analytical Framework

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Solution Space

Joint Vision 2020

Full Spectrum Dominance

FORCEnet

Sea Strike

Sea Shield

Sea Basing

Sea Trial

Sea Enterprise

Sea Warrior

Driving Mission Needs

DoDAF

SoS Architecture Solutions

Joint Capabilities Integration and Development System (JCIDS)

Joint Functional Concepts

Integrated Architectures

Joint Operating Concepts

ICD MS-A CDD MS-B CPD MS-C IOC

JROC DAB/ ITAB JROC DAB/ ITAB JROC DAB/ ITAB

JCIDS Analysis

REFINE ANALYSIS

REFINE ANALYSIS

Capability Based Acquisition

Analysis Space

Value-based Decision Framework

- Goals
- Effects
- Capabilities

Prioritize

- Prioritized "Best Value" Solutions
- Substantiated Business Cases
- Acquisition / Technology Roadmaps
- Life Cycle Enterprise Management

Changing Needs

New Technologies

Analyze

System Performance (MOP)

Operational Utility (MOE, MOO)

Effects Based Modeling & Simulation

Cost, Schedule, Risk Analysis

$$

"Qualified" Candidate Solutions

Architecture Physical World User / Operator

Operational Behavior / Interoperability

Dynamic CONOPS Analysis

User Portal

Collaborative Tool

Common Data Repository

Collaborative Environment

Drive Joint Needs into Joint Capabilities

Conclusions

- **Create framework for effective Joint Collaboration and Decision Authorities**
- **Select an Acquisition Strategy that matches the roles & responsibilities between Government and Industry**
- **Consider Enterprise System Engineering & Integration as a critical element of your acquisition strategies**
  - **Focused on both Mission Effectiveness and Operating Efficiency**
  - **Integrated at all levels: Enterprise, System, Platform, Component**

Effective Partnering is Key to our Mutual Success